

1. A method of optimizing a cycle time of a liquid dispensing module,
comprising:
- providing a liquid dispensing module having a dispenser body capable of
receiving and discharging a flow of the liquid and a pneumatic actuator, the
- 5 dispenser body including a flow-control mechanism having a first condition in
which the flow of the liquid is discharged from the dispenser body and a second
condition in which the flow of the liquid is blocked, the pneumatic actuator
having an air piston housing containing an air cavity, an air piston located in the
air cavity, and a solenoid valve capable of controlling the flow of pressurized air
- 10 to and from the air cavity for alternatively applying an actuation force to the air
piston and removing the actuation force from the air piston, the air piston
operatively coupled with the flow-control mechanism for providing the first
condition when the actuation force is applied and the second condition when
the actuation force is removed, the air cavity having an initial air volume and the
- 15 pneumatic actuator having an effective valve flow coefficient;
- specifying a first value for one of the initial air volume and the effective
valve flow coefficient; and
- determining a second value of the other of the initial air volume and the
effective valve flow such that the cycle time is less than or equal to 9
- 20 milliseconds.